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The Oera Linda Boek A literary forgery and its paper

Introduction

The 'Oera Linda Boek' can be considered one of the most curious products of Dutch literature. The only certainty about it is that it's not what it pretends to be. The manuscript claims to have been written in 1256 as a copy of an even older one. The eldest part of the text would date more than 2000 years before our era, the latest c. 50 B.C. On 190 pages, written in a unique 'runic' script the story unfolds of a mythical Frisian¹ empire, its laws and religion and its decline (figure 1).



Figure 1: *The Oera Linda Boek* (Tresoar, Frysk Histoarysk en Letterkundich Sintrum, Leeuwarden, the Netherlands)

The manuscript came to light in 1867 when it was in the possession of Cornelis over de Linden as a family heirloom. Through the ages, the ancestors of Over the Linden would have compiled the various parts of the text and passed the manuscript on. It soon became clear that the Oera Linda Boek was not an authentic history or even an ancient text, although some, even today, passionately defend its authenticity. However, the support -machine made paper-, the language -a mixture of old Frisian and modern Dutch- as well as the fabulous content all spoke too clearly for a modern origin.²

Still, the Oera Linda Boek is a mystery that has fascinated many scholars: what was the purpose of this huge undertaking, what the meaning of the text, who wrote it and when. In a recent thesis research Goffe Jensma interprets the text as a religious allegory, painting in mythological terms the nineteenth century dispute between religious modernists and conservatives.³ The author would be François HaverSchmidt, a famous poet and clergyman. He worked not alone but in league with the 'owner' of the manuscript, Cornelis over de Linden, and Eelco Verwijs, archivist and librarian of Friesland and a renowned philologist.

1. The name 'Frisia' refers to the homeland of a German tribe in the beginning of our era, consisting of the entire coastal area of the Netherlands and Northern Germany up to the river Weser. It is the 'ancestor' of the modern Dutch province of Friesland.

2. The manuscript was first published in 1872 by Ottema: J.G. Ottema, *Thet Oera Linda Bok. Naar een handschrift uit de dertiende eeuw. Met vergunning van de eigenaar, den heer C. over de Linden aan Den Helder* [Thet Oera Linda Bok, After a manuscript from the thirteenth century. With permission from the owner mr. C. over de Linden from Den Helder], 1872. A new text edition of the Oera Linda Boek: Goffe Jensma, ed., *Het Oera Linda-boek. Facsimile – transcriptie – vertaling*, 2006. The entire Oera Linda Boek is reproduced on the website www.oeralindaboek.nl.

3. Goffe Jensma, *De gemaskerde God. François HaverSchmidt en het Oera Linda-boek* [The masked God. François HaverSchmidt and the Oera Linda-boek], 2004. Goffe Jensma, *Inleiding* [Introduction] to the new text edition of the Oera Linda Boek (see note 2). A discussion on the recent developments in the Oera Linda Boek research in the historical journal *Bijdragen en mededelingen betreffende de geschiedenis der Nederlanden. The Low Countries historical review*, vol. 121 (2006).

It is evident that the Oera Linda Boek has many meanings. Apart from the religious reference, there are also links to a Frisian tradition of history writing in which fact and fiction are inextricably mixed. The Oera Linda Boek can be placed in the European tradition of historical and literary forgeries like the songs of Ossian (Macpherson, Scotland 1760-1763), the K  niginhof and Gr  nberg manuscripts (V  clav Hanka, Bohemia 1817-1818) and others. The Oera Linda Boek differs from all these in its irony and the different levels of interpretation that are possible.

According to Jensma, the Oera Linda Boek was not intended to deceive its readers permanently; it was not a fraud but a mystification. Various signs were incorporated both in its form and in its content to warn the reader that all was not as it seemed to be. A major one of these signs would be the paper which, it is supposed, created an illusion of authenticity but could not have fooled the nineteenth century reader for long.

Apart from its role in the interpretation of the Oera Linda Boek, the paper support also appears to be crucial for dating the manuscript, which is connected to another important question, that of authorship. The paper has been investigated in the years 1873-1876, shortly after the Oera Linda Boek became public.⁴ The experts agreed that the paper was made after 1800 and most thought it to be a laid machine made paper, artificially yellowed and produced in the 1840s or later. Except for an inspection by a German paper maker in the 1930s, who confirmed the machine made character of the paper, no new research has been done in this respect. Never subjected to paper research are some unused blank sheets of paper, similar in appearance to the Oera Linda Boek (OLB) paper, from the estate of Over de Linden.

Research aims

Our interest in the Oera Linda Boek was in first instance triggered by the nineteenth century paper

research that induced us to ask a number of questions. These concerned the choice of characteristics for identification and dating the paper, and the fact that obvious criteria (at least to us as modern investigators) like fibre direction and the imprint from the wire mesh were ignored. Another intriguing fact was the tension between some of the data and the conclusions thereupon. Therefore our first aim was to consider how the nineteenth century experts investigated the paper and compare their results with those of our own paper investigation based on present day knowledge and techniques.

The evaluation of the early paper research provided us with another reason to investigate the OLB paper anew. As the paper plays an important role in the recent interpretation of the manuscripts purpose and in establishing its date, the paper investigation should be much more accurate and elaborate than it has been up to now; new information might be extracted from the paper concerning its date, original appearance and the ageing treatment. Finally, comparison of the unused, blank sheets to the OLB paper may provide a direct proof of the involvement of one of the 'suspects', Cornelis over de Linden in the creation of the manuscript. In the present article we will limit ourselves to the second research aim of finding new information on the manuscript.

State of the Oera Linda Boek research

In order to understand the choice of our research aims more clearly, something in general must be said about the Oera Linda Boek discussion. Since the late nineteenth century it has been evident that the Oera Linda Boek is not an ancient manuscript. From the perspective of the paper, we may take it for granted that the experts in the nineteenth century could perfectly distinguish thirteenth century paper from modern paper of their own time.⁵ A decisive argument against the text itself is the language which may at first look like

4. Hugo Suringar, *Verklaring over het papier van het O.L.B.* [Statement on the paper of the Oera Linda Boek], may 1874, original manuscript in Tresoar Leeuwarden; Frederik Muller, *Oudheid van papier en schrift van het Oera Lindaboek* [The age of paper and ink from the Oera Linda Boek], in: *De Nederlandsche Spectator*, 5 augustus 1876; P. Smidt van Gelder, letter to Frederik Muller, attached to the article 'Oudheid van papier en schrift', in: *De Nederlandsche Spectator*, 5 augustus 1876. The publications by Muller and Smidt van Gelder are reproduced on www.oeralindaboek.nl. Dr. Ottema, editor of the Oera Linda Boek and a firm believer in its authenticity performed his own paper investigation and reported on it in the *Voorbericht* [Preface] of the second edition of the Oera Linda Boek: Dr. J.G. Ottema, *Thet Oera Linda Bok. Naar een handschrift uit de dertiende eeuw*. Tweede uitgave 1876. More details on the paper investigation are in the unpublished correspondence of Muller, Smidt van Gelder and Ottema. Excerpts or r  sum  s to be found in: P.F. Obbema, *Het papier van het Oera Linda Boek*, 1960. Typoscript, Tresoar, OLB-Collectie, Archief Hellinga, Scriptie P. Obbema.

5. It would be more accurate to say: were perfectly able to identify modern paper, since there was the problem that no thirteenth century paper was available for comparison with the OLB paper and that only one of the experts, the dealer in antique books Frederik Muller, had ever seen paper from the thirteenth century.

old Frisian but actually has a modern Dutch syntax. But if the book is not authentic, what is it? The main source for answering this question is the manuscript itself. In his thesis Jensma reconstructed the production process on the basis of some of the formal characteristics (script and language) and the content of the manuscript:

- First an original version of the text was made. This was not yet in the form of a chronicle as the final book but was just an allegory of the religious battle between modernists and conservatives. Since the religious meaning of the text depends on the ambiguity of the pseudo old Frisian language a translation must have been made or at least foreseen by the writer;
- In the second stage the original text is dismembered and transformed into a chronicle of the Frisian people and of the Over de Linden -in Frisian Oera Linda- family. Members of this family are introduced in the text as compilers through the ages of the various stories, laws and religious accounts gathered in the book. The nature of a family chronicle made it possible to make the book public through the services of Cornelis over de Linden as the last in a long line of compilers and later on keepers of the book;
- It is also concluded from the manuscript itself that at least three individuals worked on it: a writer/translator, a copyist who made the physical manuscript and an editor who corrected the writing errors of the copyist and the translation of the writer.

Very little direct written evidence is available to put a name to these three persons. The reasons to ascribe the Oera Linda Boek to François HaverSchmidt, the poet and modernist vicar, Eelco Verwijs, the philologist and Cornelis over de Linden, who was the chief of the construction department of the navy wharf in Den Helder, are beyond the scope of this study. Enough to say that HaverSchmidt is mainly credited with the creative role of writer, that Verwijs acted as editor and Over de Linden did the physical production of the manuscript. The important point is that in order to make this conclusion work, time limits have to be taken into account:

- The first version of the text must (in terms of opportunity and motive) have been made when HaverSchmidt was vicar of Foudgum in the province of Frisia, that is from 1859 till 1862;
- The second stage of the writing of the text and the production of the actual manuscript could only have taken place after HaverSchmidt met over de Linden, which took place when he was transferred to Den Helder in 1862.

Internal and external evidence from the manuscript itself makes, according to Jensma, a date from the late eighties to the early sixties plausible. But only the paper as an external characteristic can give the decisive *terminus a quo* for the present manuscript. As the nineteenth century research results could not be accepted without careful evaluation, further investigation of the OLB paper seemed necessary.

The modern interpretation of the Oera Linda Boek as an experimental literary text is based on the observation that all the characteristics to make it look like an ancient manuscript are illusions to be dispelled by the reader. The paper was for instance artificially yellowed but should in the end still have been recognizable as modern. However, the colouring substance was never identified. Therefore another subject of our investigation deals with the method used by the maker to give the paper an old appearance and with how convincing the end result was.

The blank sheets from Over de Linden's estate have been regarded as identical to the OLB paper and connected to it in several ways:⁶

- the blank sheets are present in the estate of Cornelis over de Linden;
- some blank sheets are numbered in pencil just as those of the manuscript and possibly with the same hand;
- stains present on the blank sheets can be interpreted as colouring proofs of the OLB paper;
- some blank sheets are cut to the same size as the OLB paper.

It is however undecided whether the two groups of paper are similar enough to assume that the OLB paper is from the same stock of paper in Over de Linden's possession.

6. For instance in the codicological description of the Oera Linda Boek by Miedema. Also P.F. Obbema, *Het papier van het Oera Linda Boek*, 1960. Typoscript, op. cit.

The testing material

For visual examination we could dispose of the entire manuscript. For scientific testing we were provided with some tiny pieces of paper that had broken off from the borders of some of the OLB pages and from the blank sheets. These scraps could not be identified to a definite page with the possible exception of one scrap bearing some partial letters. It is very likely that the origin of this 'letter' scrap is from text page 143 (figure 2).⁷

A visual examination of the sieve impression was done on the complete OLB and blank sheets. For fibre analysis, measurement of paper thickness, spot tests for rosin and starch as for XRF (X-ray fluorescence) tests the scraps were used. Consequently the visual and the instrumental examination may well have been performed on different sheets. Our initial assumption, based upon visual examination, was that all OLB pages are identical (same source, composition and properties) as well as all blank sheets. Though this assumption was shared by previous modern investigators, in the end we decided it could not be taken for granted. This was confirmed when we discovered that fibre analysis in two different OLB scraps showed different results. As a consequence of our initial assumption the scraps were at first used indiscriminately, which could not be corrected afterwards in all cases by lack of material. This is not equally important for all our research questions. It is for instance irrelevant for the analysis of the ageing treatment. For the rest the main consequence is that test results cannot be 'added up' unless explicitly stated that investigations were performed on the same scrap of paper.

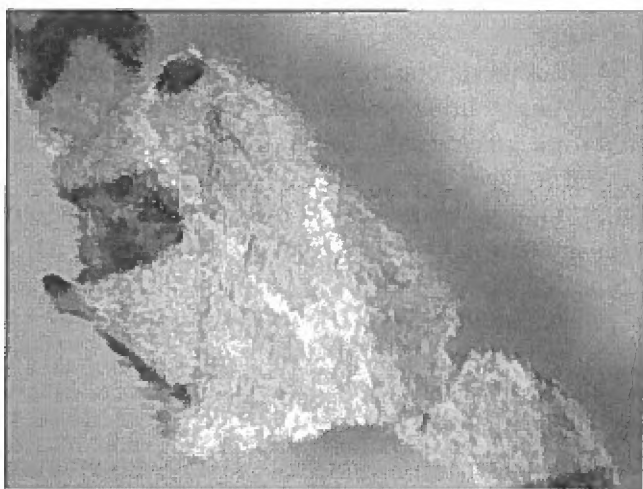


Figure 2: 'Letter' scrap: scrap of Oera Linda Boek paper with partial letter used for XRF testing, fibre analysis and measurement of paper thickness

Results of our observations and testing of the Oera Linda Boek paper

First of all we wanted to establish whether the OLB paper is really machine made. The nineteenth century experts make this observation but seem to base their opinion on the general appearance of the paper like its smoothness. We wanted to see the impression of the machine wire mesh and notice the fibre direction. Although the fibre direction could not be tested due to the generally bad condition of the paper, a laid pattern was observed on the light table and the impression of a wire mesh determined under raking light. On the basis of this combination we concluded that the paper was made on a Foudrinier machine equipped with an égoutteur as we expect that the cylinder mould machine would leave either a laid or a wove impression. The use of machine made paper in the Oera Linda Boek can be deduced independently from the presence of rosin size as proved by the Raspail test on two scraps of paper. Rosin (tub) sizing is exclusively adopted in machine made paper. The iodine test on the same scraps showed starch, a usual addition to rosin size. The paper fibres of two of the OLB scraps were examined microscopically, using Herzberg staining. Microscopic analysis of one scrap ('anonymous') showed that the paper consisted of long linen fibres (figure 3, left). A floroglucine test proved the absence of mechanical wood pulp. The length of the fibre (3 – 6 mm) indicated that the beating had not been not very strong. The second scrap used for fibre analysis, the 'letter' scrap, showed a completely different fibre composition: chemical wood mixed with cotton (figure 3, middle).⁸

X-ray fluorescence spectrometry (XRF) was performed on the 'letter' scrap. This test is part of an ongoing series of tests, on which work is still in progress. The interpretation of the present research result is still a matter of debate. Our preliminary qualitative conclusion is that XRF indicates the absence of a significant (measurable) amount of aluminium in the paper (figure 4, left). If correct, this means that alum would be absent⁹, as well as china clay as a filler. If a filler is actually added, the most probable alternative is gypsum, CaSO_4 , though we cannot yet be certain that enough sulphur and calcium are present in the paper. No other serious candidates before 1869, when the whole of the Oera Linda Boek had actually been seen, are available. However, it is not unusual that a filler is lacking in early machine made paper.

Table 1 profile of the Oera Linda Boek paper

COMPONENT	'ANONYMOUS' SCRAP	'LETTER' SCRAP
Fibre	Linen; long fibre, 3 – 6 mm. No ground wood (floroglucine test)	Chemical wood in combination with cotton
Filler	Not tested	Absent or small amount? If present probably gypsum



Figure 3: Microscopy of the fibres of the 'anonymous' scrap (left), the 'letter' scrap (middle), and a scrap from one of the blank sheets (right)

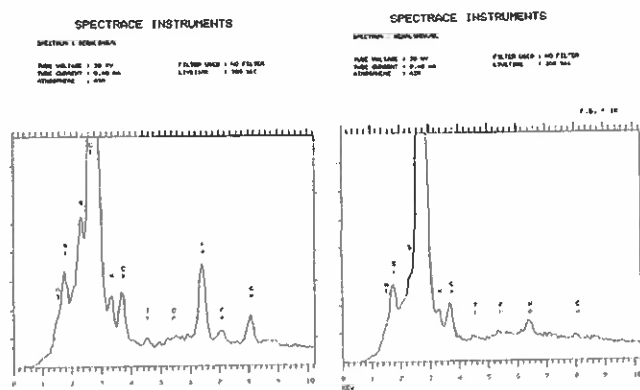


Figure 4: XRF spectrum of the paper from the 'letter' scrap (left), and a scrap from one of the blank sheets (right)

Ageing treatment

The makers of the Oera Linda Boek made an effort to give the paper an old look. A yellow colouring material was used. Originally the OLB paper was white. This becomes evident when a tiny bit of fibre is scratched from the surface. The many wrinkles in the

paper indicates that it was treated in an aqueous solution and dried under pressure afterwards. Our initial assumption that the colouring agent was a dilution of the ink used for writing was not confirmed. The writing ink is an iron-gall ink, as shown by the occurrence of ink corrosion (figure 5).

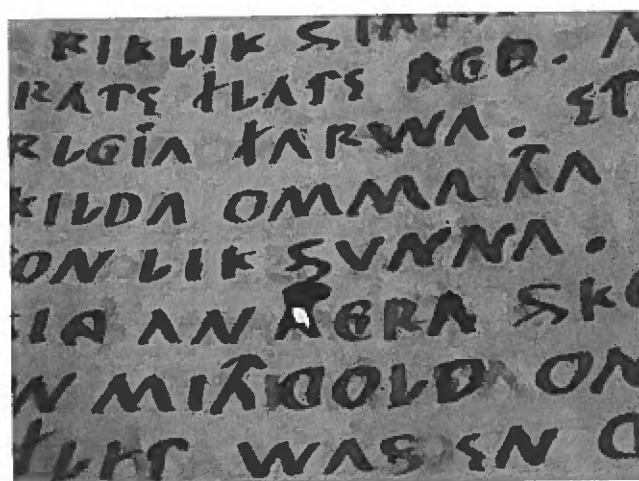


Figure 5: Ink corrosion on one of the pages of the Oera Linda Boek

Both background colour and writing ink contain, according to XRF tests, iron but are not identical:

- the ink contains arsenic and no sulphur;
- the background colour contains sulphur and no arsenic.

The nature of the background colour is still unclear. It has been suggested that the writing was done before colouring the paper.¹⁰ This does not seem to be correct. Presence of the colour underneath a letter which had flaked off the paper shows that the colour treatment was probably performed before the writing

7. Information Goffe Jensma. The scrap with a partial letter or letters (figure 2) can only come from a page where text is damaged. This would limit the possibilities to pp. 21-23, 120, 143-148.

8. A fibre analysis was also performed in 1873 on request of dr. Ottema the first editor and a strong defender of the Oera Linda Boek. For this analysis some material from the last quire was used. As a result cotton fibre was found. It remains to be seen how reliable this result is, since the local apothecary, who actually did the test, is not known to have had any experience with the difficult art of fibre analysis.

9. In the late 1850s a non-acidic sizing is actually an anomaly; the rosin-starch combination found in the OLB paper is known from an earlier period (1840s) as an experimental sizing. See note 15.

10. H. Miedema, *Codicologische beschrijving van het handschrift genoemd 'het Oera Linda Boek' te Leeuwarden*, 1956. Typoscript, Tresoar, inv. nr.: OLB C 50.

process (figure 2).

Results of observation and testing of the blank paper

Under the microscope the scrap from one of the blank sheets showed chemical wood pulp and straw fibres clearly different from the linen fibres in the first batch of the Oera Linda Boek paper ('anonymous' scrap) but strongly resembling the fibre composition of the second batch, the 'letter' scrap as both contain chemical wood (figure 3).

An XRF test has been done on one of the blank paper scraps. The chemical composition of the blank scrap appears to be similar to the OLB 'letter' scrap (figure 4) – no alum, possibly gypsum – with the same restriction already mentioned that the interpretation of our XRF tests is still a matter of further research and discussion.

Finally, when we investigated the laid pattern *in situ* on three of the blank sheets¹¹ and on pages 10 and 11 of the OLB, hardly any difference was found.

Table 2 comparison Oera Linda Boek paper and blank sheets

CHARACTERISTICS OLB PAPER		CHARACTERISTICS BLANK SHEETS
Fibre	Batch 1 : Linen; 3 – 6mm ('anonymous' scrap)	Chemical wood and straw
	Batch 2: Chemical wood and cotton ('letter' scrap)	
XRF spectrum	No alum, possibly gypsum ('letter' scrap)	No alum, possibly gypsum*
Laid pattern	Average distance between chain lines: 2.8 cm; laid lines: 17 per 33 mm	Average distance between chain lines: 2.8 cm (3 sheets measured); laid lines: 17 per 33 mm

* possibly tested on another scrap than the one used for fibre analysis

While fibre analysis and, independently, XRF resulted in a clear resemblance between part of the OLB paper and the blank sheets, the thickness of the paper, measured with a micrometer, according to ISO 534 showed a difference which might suggest two sorts of paper. However we think that this suggestion is incor-

rect: the thickness of the OLB paper, i.e. its reaction to the pressure of the measuring instrument, may have changed by the treatment it received to give it an old appearance. It is obvious from visual inspection that the OLB paper is now in a different condition than the blank sheets (figure 6).

Table 3 comparison of the paper thickness of the Oera Linda Boek paper and blank sheets

CHARACTERISTICS OLB PAPER	CHARACTERISTICS BLANK SHEETS
0.130 mm (average of 4 scraps among which the 'letter' scrap)	0.114 mm (1 measurement on a single scrap)*

*possibly observed on another scrap than the scraps used for XRF and fibre analysis

¹¹ The blank sheets can be retraced through the pattern of discoloration which we noted down.

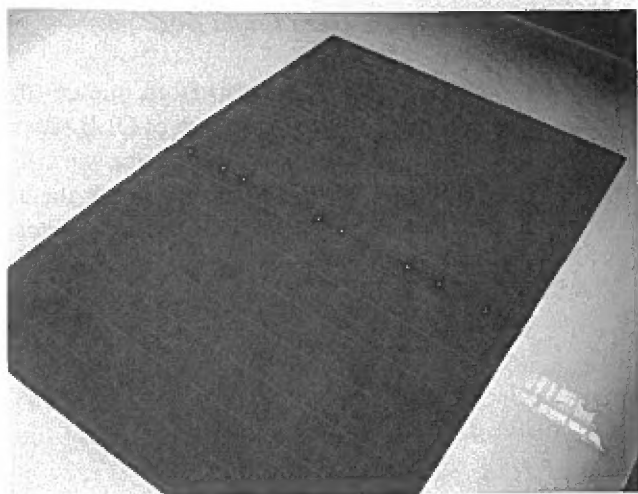


Figure 6: *Blank sheet with laid pattern*

Preliminary conclusions

Identity and date of the Oera Linda paper

Although of (at least) two different kinds, the Oera Linda Boek is made on laid machine paper. Its earliest possible production date is in the 1830s because the *égoutteur* was not introduced before that time. Part of the OLB paper (batch 1) is made from linen. The absence of cotton mixed with the linen fibre is an indication that the paper was produced in the first half of the nineteenth century, as linen fabric generally contained cotton threads after the 1850s.¹² Though it is too early for a definite conclusion, our estimate for this type of paper is therefore in the earlier part of the time range proposed by the nineteenth century experts. Considering that linen was regarded as a better paper fibre than cotton, in combination with the

restraint manner of beating, we must assume that this part of the paper in the Oera Linda Boek belonged to the best sorts of paper, possibly produced especially with a view of durability. In the navy organisation, where Cornelis over de Linden worked, the use of strong and durable paper for instance for logs and notebooks was common practice. Therefore, this type of the paper may have been easily available at Den Helder (figure 7).

Another part of the OLB paper (batch 2) is made of chemical wood. This paper we identify as soda paper produced in England in 1866 or later. Three techniques existed for making wood cellulose: soda (natron), sulphite and sulphate pulping methods. The last two date after 1873. The soda method was developed in the United States from the middle of the eighteenth fifties but a date for this part of the paper in the Oera Linda Boek after 1866, when the process was introduced in England, is much more likely.¹³

The time difference between the OLB batches of paper is not inexplicable. Paper was a rather scarce and costly material till late in the nineteenth century and to save a stock of paper for later use would have been a logical procedure.

The production date of the second batch of OLB paper did not leave the creators of the Oera Linda Boek much time for making the manuscript before its existence became known in June 1867. From this point on Jensma's line of reasoning that the Oera Linda Boek was partly made after 1867, when the first sheets were already circulating among scholars in Friesland, becomes relevant. It seems reasonable to suppose that this late part of the Oera Linda Boek is written on sheets from the batch of soda pulp paper. If so, it would be a confirmation of Jensma's reconstruction.

12. N.W.P. Rauwenhoff, *Over de gebreken van vele papiersoorten* [On the defects of many paper sorts], 1854, p. 436 en 458.

13. The soda process was patented in the USA in 1854 and soda pulp was probably produced for the market in the region of Philadelphia since the late 1850s. The first major soda pulp plant was operational in 1866.

Just as later on in Europe, a strong prejudice at first existed against the new material. As the early output of soda pulp paper in relation to the total paper production must have been small and the USA is not known as a major paper exporter to the Netherlands, we feel that an American origin is unlikely for the OLB paper. In England, which was a paper exporter to the Netherlands, soda pulp production began in 1866. The soda technique was introduced in Germany only in 1872.

See: David C. Smith, *History of papermaking in the United States, (1691-1969)*, 1970, p. 130-131; Dard Hunter, *Paper making, The history of an ancient craft*, p. 390-391, 1978 (1947); Carl Hofman, *Handbuch der Papier-Fabrikation*, II Band, 1897, p. 1391-1398; E. Kirchner, *Das Papier, I. Teil, Die Geschichte der Papierindustrie und Allgemeines über Papier*, p. 22, 1897; Wiso Weiss, *Zeittafel der Papiergeschichte*, 1983.

Collings and Millner paint a somewhat different picture. They state that soda pulp was used in Lydney Mills, England in the years 1856-1869. However for 'publication grades' made from straw, rag and chemical wood pulp, they provide us with 1868 as a date. Thomas Collings and Derek Milner, *A new chronology of papermaking technology*, in: *The Paper Conservator*, 1990.

Bij den Uitgever dezès is mede uitgegeven:

<i>Reisingsgids naar, in en uit Oost-Indië, volgens het Eng van J. Koning, vermeerderd en verbeterd door G. Kuyven, Luit.-Ingenieur.</i>	f 5
<i>Mrs. TAYLOR, Aantafels, waardoor de ware afstand van schijnbare hoogten gemakkelijk en op de kortste wijze wordt, enz.</i>	f
<i>Inkomende en Uitgaande Regten, Tarieven, Reglement Bestuiten van Nederlands Oost-Indië, voor Reeders, Voerders en Handelaars.</i>	f
<i>Gedrukte Scheeps-Journalen voor eene O. I. Reis.</i>	f 2.75 —
<i>Idem idem voor eene W. I. Reis.</i>	» 1.80 —
<i>Gehynde idem voor eene O. I. Reis.</i>	» 2.50 —
<i>Idem idem voor eene W. I. Reis.</i>	»
<i>Kleinere Journaals.</i>	» 1. —
<i>Gedrukte Logboeken van fijn Kardoespapier.</i>	» 2. —
<i>Blanco idem idem.</i>	» 1. —
<i>Scheeps-Consumente- of Notitieboek voor alle ontragnene en bruikte Provisie en Scheepsbenodigdheden.</i>	f
<i>Idem voor den 24^{en} Stuurman.</i>	»
<i>Scheeps-Provisieboek voor den 3^{den} Stuurman.</i>	»
<i>Idem voor den Holmeester.</i>	»
<i>Bootsmans Notitieboek van ontragnen en verbruikt Touwwerk.</i>	»
<i>Scheeps-Ladingsboekjes.</i>	f —.20 —
<i>Scheeps-Inventarisboekjes.</i>	»
<i>Handboekje voor Zeelieden, zijnde eene berekening der D. den.</i>	f

Figure 7: Advertisement in a maritime reference book (1843) for 'naval stationary' paper. Explicitly mentioned as paper for one type of ships log is 'kardoespapier', a very sturdy paper

The comparison of the Oera Linda Boek paper with the blank sheets

The fibre composition of the scrap from one of the blank papers differs from the first batch of OLB paper but corresponds to the second batch in one specific aspect: both contain chemical wood. The blank sheets from Over de Linden's estate have of course as latest production date the year of his death 1874. Just as argued for the chemical wood containing OLB paper, the time limit indicate that the chemical wood found in the blank paper must also be soda pulp. In general, paper made from soda pulp can be considered as uncommon; in 1874 it was still produced in only a few mills.¹⁴

According to our provisional interpretation of the XRF tests, the spectrum of the second batch of OLB paper is very similar to the spectrum of one of the blank sheets. The spectra indicate that some normally used substances in middle and later nineteenth century paper making seem to be absent in both papers: alum¹⁵ and china clay as filler.¹⁶

Even though fibre analysis and XRF tests for the blank paper may not be added together into a single paper profile (since it is not certain that both were observed on the same paper scrap), it is obvious from the similarity of the two groups of paper and the atypical composition (soda pulp, no alum) that Over de Linden and the maker(s) of the Oera Linda Boek delved into the same stock of paper. Paper analysis thus reveals the involvement of Over de Linden in the production of the Oera Linda Boek.

Perhaps the blank papers are even left over from the Oera Linda Boek production. This will have to be learnt from our further paper investigations. So far, the role of the blank sheets remains rather mysterious. Some are prepared as OLB pages but not actually used. As if someone (Cornelis over de Linden?) had decided to add more pages to the Oera Linda Boek but dropped the idea.¹⁷

14. In the USA the number of mills producing soda pulp as well as the total quantity of soda pulp production remained limited in comparison with the fabrication of sulphite pulp and ground wood. In Europe, apart from Britain, soda pulp production just started in the early 1870s. See also note 13.

15. Absence of alum would be very unexpected. Both for gelatin and rosin (tub) sizing alum was routinely used. For the OLB paper we expect tub sizing, as was common (but not universal) for machine made paper. A spot test on one OLB scrap has shown the presence of rosin. A tub size without alum is only known to us from the early, experimental phase of this kind of sizing. As an example: a recipe book from the Dutch Van Gelder firm has a recipe for a tub size based on rosin and starch ('aardappelmeel'), which probably dates 1838 when the firm introduced tub sizing. This recipe is followed by a 'normal' one containing rosin and alum dated 1845. Van der Grijn en Kardinaal, *Technische ontwikkelingen in de Nederlandse papierproductie in de eerste helft van de negentiende eeuw*. [Technical developments in the Dutch paper production during the first half of the nineteenth century], p. 112-113.

16. We suggested as possibilities the presence of gypsum as a filler and the absence of any filler at all. Gypsum, if present in the OLB and/or blank paper, was a common filler in the first half of the nineteenth century. It was substituted in the 1850s by china clay, but continued to be used. Van der Boon Mesch found in 1845 gypsum in 9 out of 30 machine made papers. In his later investigations he discovered that from the late 50s on gypsum was being replaced by 'eene of andere fijne kleisoort' [some kind of fine clay]. The investigation of Van der Boon Mesch also shows that machine made paper without filler was normal around 1850. In 1879 on the other hand it is stated that almost no machine made paper was produced without at least 15-20% filler. It is uncertain when it became common practice to load the majority of machine made papers. See Van der Boon Mesch, *Over de oorzaken van de ondeugzaamheid en spoedige vergankelijkheid van eenige papiersoorten* [On the causes of the lack of durability and the easy perishability of some paper sorts], 1848, p. 18; A.H. Van der Boon Mesch, *Over de oorzaken van de ondeugzaamheid en spoedige vergankelijkheid van eenige papiersoorten*, in: *Tijdschrift ter Bevordering van Nijverheid*, 1861, p. 299. This is the second printed and enhanced version of the report on the research by Van der Boon Mesch; Van der Grijn en Kardinaal, *Technische ontwikkelingen*, op. cit., p. 85-86.

17. This is the interpretation of the historian Murk de Jong in *Het geheim van het Oera Linda Boek* [The secret of the Oera Linda Boek], 1927, p. 354 – 365.

Epilogue

Our work on the Oera Linda Boek paper is still in progress and hopefully we can eventually use our

future findings to reveal more of the fascinating mystification that the three men depicted underneath have created (figure 8).

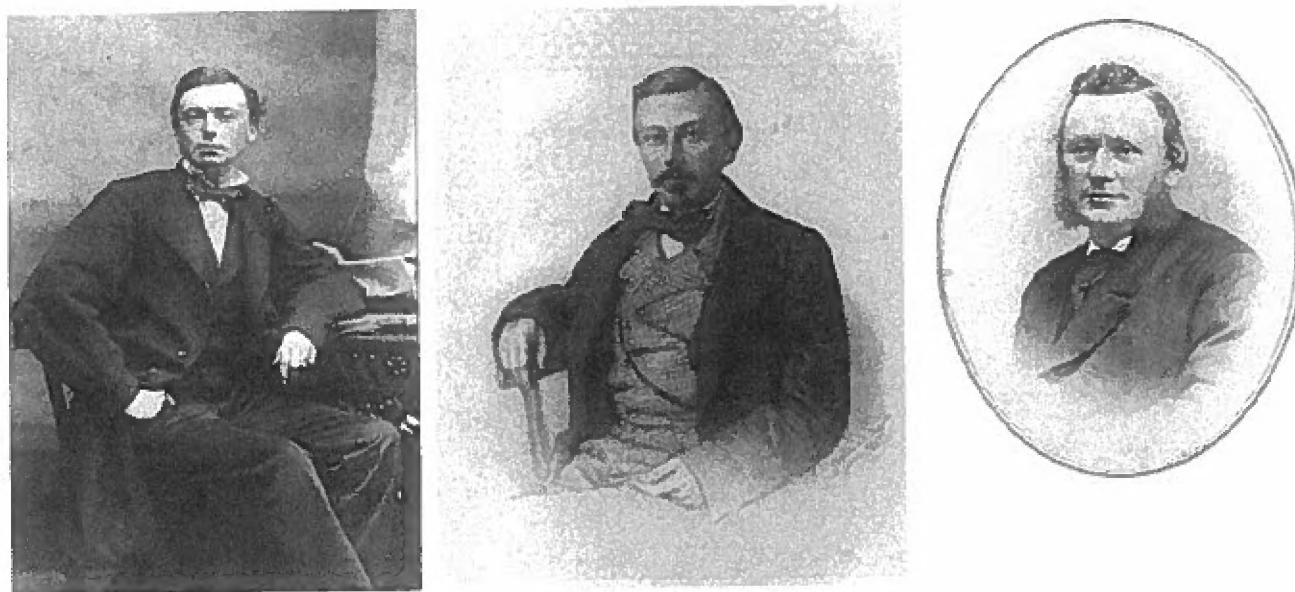


Figure 8: *Composition of the portraits of (left to right) François HaverSchmidt, Eelco Verwijs and Cornelis over de Linden*

ACKNOWLEDGMENTS

Jacob van Sluis, Tresoar, Frysk Histoarysk en Letterkundich Sintrum, Leeuwarden, the Netherlands.
Georgine Calkoen, Proost en Brandt Laboratory, Diemen, the Netherlands.

Peter Hallebeek, Netherlands Institute for Cultural Heritage (ICN), Amsterdam, the Netherlands.
Goffe Jensma, University of Amsterdam, KNAW-Fryske Akademy, Leeuwarden, the Netherlands.